

Tuberculosis treatment: integration between hospitals and public health care clinics in the city of São Paulo, Brazil*

Tratamento de tuberculose: integração entre assistência hospitalar e rede básica na cidade de São Paulo

Mirtes Cristina Telles Perrechi, Sandra Aparecida Ribeiro

Abstract

Objective: To evaluate the level of access to health care clinics of a population of patients hospitalized for tuberculosis (TB) at two hospitals in the city of São Paulo, Brazil, comparing them with a population of TB patients under outpatient treatment only. **Methods:** We compiled sociodemographic, clinical and epidemiological data related to patients hospitalized for TB at two hospitals in the city of São Paulo, Brazil, between January and December of 2007, using a structured questionnaire. We also identified the outpatient clinics to which the patients were referred at discharge. The same variables were evaluated for TB outpatients during the same period, using a database. **Results:** The study sample consisted of 474 patients (166 inpatients and 308 outpatients: mean age, 41.0 and 39.1 years, respectively). The univariate analysis showed positive associations between hospitalization due to TB and the following variables: 30-39 year age bracket (OR = 2.17); 50-59 year age bracket (OR = 2.17); combination of pulmonary and extrapulmonary forms of TB (OR = 5.31); TB re-treatment (OR = 2.66); seeking treatment at other health care facilities prior to the diagnosis of TB (OR = 2.05); symptom duration of more than 12 weeks (OR = 2.23); and TB diagnosed at hospitals or in emergency rooms (OR = 4.68). The proportion of inpatients who resided in the same regional health district area as that in which the respective hospital was located was 77.6% and 36.8%. The proportion of discharged patients who were referred to outpatient clinics in the same areas was 67.1% and 39.7%, respectively. **Conclusions:** Patients hospitalized for TB should be monitored from discharge until their admission to the outpatient clinic.

Keywords: Tuberculosis; Health services accessibility; Inpatients; Outpatients.

Resumo

Objetivo: Avaliar o nível de acesso aos serviços de saúde de uma população de pacientes internados por tuberculose (TB) em dois hospitais no município de São Paulo, comparando-os com pacientes com TB submetidos somente a tratamento ambulatorial. **Métodos:** Foram levantados dados sociodemográficos e clínico-epidemiológicos de pacientes internados por TB em dois hospitais do município de São Paulo entre janeiro e dezembro de 2007, utilizando-se um questionário estruturado. Foram também identificados os locais de tratamento ambulatorial para os quais os pacientes foram transferidos após a alta hospitalar. As mesmas variáveis foram obtidas para pacientes ambulatoriais em tratamento de TB na mesma época, por meio de um banco de dados. **Resultados:** Foram estudados 474 pacientes (166 internados e 308 ambulatoriais), com média de idade de 41,0 e 39,1 anos, respectivamente. A análise univariada mostrou associações positivas entre internação por TB e as seguintes variáveis: faixa etária 30-39 anos (OR = 2,17), faixa etária 50-59 anos (OR = 2,17), forma clínica pulmonar associada à extrapulmonar (OR = 5,31), retratamento de TB (OR = 2,66), procura a outro serviço antes do diagnóstico (OR = 2,05), tempo de sintomas maior que 12 semanas (OR = 2,23) e diagnóstico realizado em hospitais ou prontos-socorros (OR = 4,68). A proporção de pacientes internados que residiam na mesma região da respectiva Coordenadoria Regional de Saúde dos dois hospitais foi, respectivamente, de 77,6% e 36,8%. A proporção de pacientes, após a alta, encaminhados a Unidades Básicas de Saúde nas mesmas regiões dos dois hospitais foi, respectivamente, de 67,1% e 39,7%. **Conclusões:** Os pacientes internados por TB devem ser monitorados após alta hospitalar até a sua chegada à Unidade Básica de Saúde.

Descritores: Tuberculose; Acesso aos serviços de saúde; Pacientes internados; Pacientes ambulatoriais.

* Study carried out in the Department of Preventive Medicine, *Universidade Federal de São Paulo* – UNIFESP, Federal University of São Paulo – São Paulo, Brazil.

Correspondence to: Sandra Aparecida Ribeiro. Departamento de Medicina Preventiva, Universidade Federal de São Paulo, Rua Borges Lagoa, 1341, Vila Clementino, CEP 04038-034, São Paulo, SP, Brasil.

Tel 55 11 5571-5000 or 55 11 5572-0609. E-mail: sandrarib@uol.com.br

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Introduction

Tuberculosis (TB) is an infectious disease with high morbidity and mortality, principally in developing countries.⁽¹⁾ In Brazil, it ranks ninth among infectious causes of hospitalization, seventh in terms of the *Sistema Único de Saúde* (SUS, Brazilian Unified Health Care System) expenditures related to hospitalization due to infectious diseases and fourth in terms of mortality due to infectious diseases.⁽²⁾

In 1979, in a groundbreaking initiative, the *Programa Nacional de Controle da Tuberculose* (PNCT, Brazilian National Tuberculosis Control Program) efficaciously put into practice the strategy of providing, free of charge, the short-course oral treatment regimen (six months),⁽³⁾ consisting of isoniazid, rifampin and pyrazinamide (regimen I). In the state of São Paulo, this new strategy, accompanied by new guidelines for treatment and hospitalization, was instituted in 1980.^(4,5)

The treatment with regimen I should be performed in outpatient clinics,^(6,7) the one closest to the place of residence of the patient, and hospitalization should be reserved for the following specific cases: tuberculous meningitis; indication for surgery due to TB; severe complications; drug intolerance that cannot be controlled in an outpatient clinic; severe clinical or surgical complications; cases in which outpatient treatment is not possible; and social cases.^(7,8)

The highest incidence rates are concentrated in metropolitan areas, where the conditions of transmission are more favorable due to the abundance of multifamily dwellings, poor living conditions, overcrowding, pockets of poverty, limited access to health care clinics; and low adherence to treatment.⁽⁹⁾

Although the diagnosis of cases of pulmonary TB is relatively simple and requires unsophisticated tests (chest X-ray and sputum examination), and despite the efforts of the PNCT to train municipal primary health care workers for correct diagnosis and treatment of the disease, it has been observed that most TB cases are still diagnosed at hospitals. In 2001, in the state of São Paulo, approximately one third of the cases were diagnosed during hospitalization, and, in the city of São Paulo, 58% of the cases were diagnosed at hospitals or in

emergency rooms.⁽¹⁰⁾ In addition, some TB cases presented as severe clinical forms.⁽¹¹⁾

The main reasons for hospitalization were as follows: elucidation of the diagnosis (in 31.7%); respiratory failure (in 19.8%); wasting (in 8%); AIDS (in 5.5%); hemoptysis (in 5.2%); and others (in 29.8%). Since the disease is easy to diagnose, it is surprising that elucidation of the diagnosis was the main reason for hospitalization.⁽¹²⁾

Currently, in the city of São Paulo, there are approximately 40 general hospitals that admit TB cases (more than 10 cases per year). We can classify the hospitals that admit TB cases as follows: referral hospitals (*Hospital do Mandaqui*, Emílio Ribas Institute of Infectology and Referral and Training Centers for Sexually Transmitted Diseases/AIDS); university hospitals (*Santa Casa de São Paulo*, University of São Paulo School of Medicine *Hospital das Clínicas*, Federal University of São Paulo *Hospital São Paulo*, University of São Paulo University Hospital and Wladimir Arruda Teaching Hospital); general hospitals; long-stay hospitals (*Sanatório S3*, *Hospital Leonor Mendes de Barros*, *Sanatório São Paulo* and *Hospital Nestor Goulart Reis*); and others. In 2001, the total number of patients hospitalized for TB in the city of São Paulo was 2,473—general hospitals accounted for approximately 47% of the total number of hospitalizations, referral hospitals accounted for 21%, university hospitals accounted for 19% and emergency rooms, together with pediatric hospitals, among others, accounted for 13%.⁽¹²⁾

It is highly likely that one of the factors related to the low cure rates of inpatients is the lack of perfect integration between hospital treatment and primary health care treatment, indicating that many patients are lost to the system or even consider themselves cured at discharge.

The low cure rates reveal the need to increase understanding of the flow of and the reasons for hospitalization, as well as to plan actions favoring the monitoring of discharged patients, in addition to adapting the information systems, in order to achieve a cure in such patients.

The objective of the present study was to evaluate the level of access to health care clinics, since this is an important factor for the diagnosis and treatment of TB cases. To that end, we mapped the place of residence of each patient hospitalized for TB at either of two large hospitals in the city of São Paulo, Brazil, as well as the

locations of the TB outpatient clinics to which they were referred at discharge, comparing these data with data related to TB patients under outpatient treatment only.

Methods

This was a prospective, clinical epidemiological, descriptive analytical study, characterized as field research and conducted between January and December of 2007 in the city of São Paulo, Brazil. In this study, we compared TB inpatients and TB outpatients in terms of their level of access to health care clinics.

The city of São Paulo has approximately 11 million inhabitants. There are 127 hospi-

tals and 382 primary health care (PHC) clinics distributed into five regional health districts. The study was carried out in the southeastern and northern regional health districts. The southeastern region has approximately 2.5 million inhabitants, 49 hospitals and 83 PHC clinics, whereas the northern region has approximately 2 million inhabitants, 21 hospitals and 76 PHC clinics.

In order to study the inpatients, we chose two hospitals that admit more than 50 TB cases/year in the city of São Paulo: the *Hospital São Paulo* (a university hospital located in the southeastern regional health district) and the Mandaqui Hospital Complex (a general and teaching hospital, considered a referral center

Table 1 – Association between variables related to patients hospitalized for tuberculosis at two hospitals in the city of São Paulo, Brazil, and variables related to tuberculosis patients under outpatient treatment only, 2007.

Variable	Inpatients (n = 166)		Outpatients (n = 308)		p	OR	95% CI
	n	%	n	%			
Age bracket							
Up to 19 years	13	7.83	23	7.47	0.160	1.79	0.79-4.04
20-29 years	25	15.06	79	25.65		1.00	
30-39 years	44	26.51	64	20.78	0.009	2.17	1.20-3.92
40-49 years	33	19.88	58	18.83	0.062	1.79	0.96-3.44
50-59 years	33	19.88	48	15.58	0.010	2.17	1.15-4.08
Over 60 years	18	10.84	36	11.69	0.213	1.58	0.76-3.25
Gender							
Male	116	69.88	204	66.23	0.419	1.18	0.78-1.77
Female	50	30.12	104	33.77		1.00	
Clinical form							
Pulmonary	115	69.28	229	74.35		1.00	
Extrapulmonary	35	21.08	73	23.70	0.844	0.95	0.60-1.51
Pulmonary + extrapulmonary	16	9.64	6	1.95	< 0.01	5.31	2.02-13.9
Type of case							
New	114	68.67	263	85.39		1.00	
Retreatment	52	31.33	45	14.61	< 0.001	2.66	1.69-4.20
Seeking treatment at other health care facilities prior to the diagnosis of TB							
Yes	119	71.69	170	55.19	< 0.001	2.05	1.37-3.08
No	47	28.31	138	44.81		1.00	
Symptom duration prior to diagnosis							
< 12 weeks	87	52.41	91	29.55		1.00	
≥ 12 weeks	79	47.59	37	12.01	0.001	2.23	1.37-3.64
No information	-	-	180	58.44			
Place of diagnosis							
Outpatient clinic	38	22.89	175	56.82		1.00	
Emergency room/hospital	120	72.29	118	38.31	< 0.001	4.68	3.03-7.22
Others	8	4.82	15	4.87			

for the treatment of TB, located in the northern regional health district). The hospitals are not exclusively regional and account for approximately 8% of the hospitalizations due to TB in the city of São Paulo.

In order to determine the level of access to health care clinics, we divided the map of the city of São Paulo into the five regional health districts (central-western, eastern, northern, southeastern and southern). On this map, we plotted the place of residence of the patients hospitalized for TB at the Mandaqui Hospital Complex and at the *Hospital São Paulo*, the locations of the PHC clinics to which the inpatients were referred at discharge and the place of residence of the outpatients under treatment in the PHC clinics located in the northern and southeastern regional health districts.

The cases included in the present study were reported to the epidemiological surveillance agencies. The patients were interviewed by the researcher using a structured questionnaire comprising closed questions about place of residence, gender, age bracket and site of TB. In addition, there were questions aimed at assessing the level of access of patients to the outpatient/inpatient treatment system—mean symptom duration prior to the initiation of

treatment and type of health care facility where the diagnosis was made (outpatient clinic, emergency room, hospital or others)—and questions related to discovery based on death certificates or surveillance in institutions, history of TB treatment or investigation of pulmonary disease and main reason for hospitalization. The inpatients were prospectively monitored after discharge in order to map their locale of treatment and their treatment outcome.

The data related to the patients under outpatient treatment only were obtained from the São Paulo State Department of Health Tuberculosis Database, and, in order to study the level of access to health care clinics, we selected outpatients treated in the PHC clinics belonging to the same regional health districts as those in which the selected hospitals were located.

The following variables were assessed: place of residence; gender; age bracket; site of TB; mean symptom duration prior to the initiation of treatment; history of TB treatment; and treatment outcome. Cases in which the diagnosis was changed were excluded, as were cases in the prison system.

In order to evaluate the statistical significance of the variables related to the inpatients and outpatients, we carried out a univariate

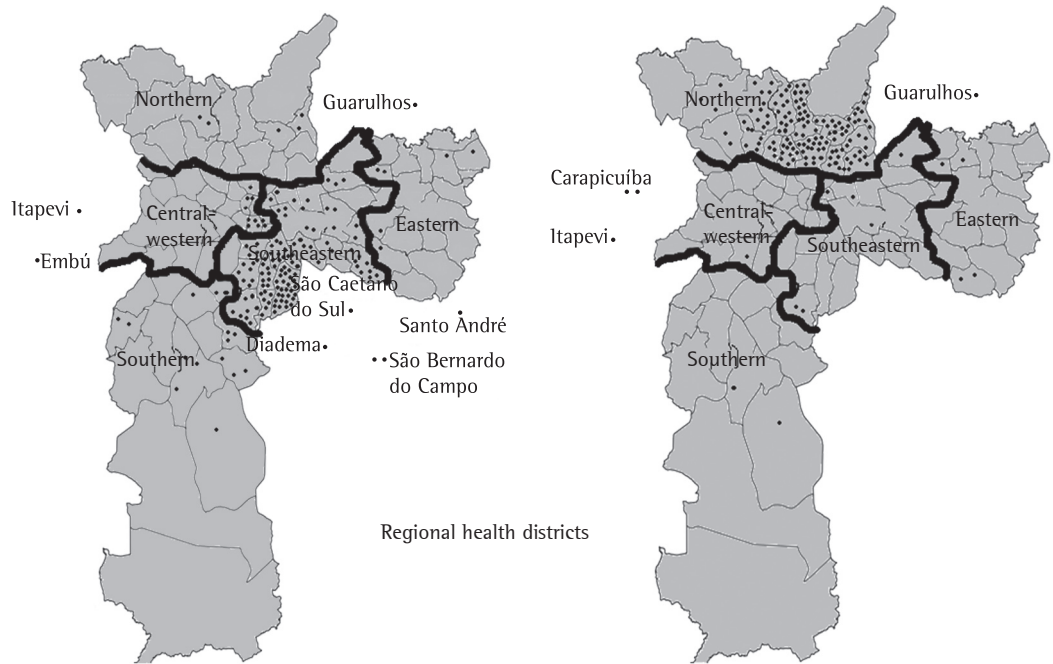


Figure 1 – District of residence of patients with tuberculosis under outpatient treatment only in primary health care clinics located in the southeastern and northern regional health districts, city of São Paulo, Brazil, 2007.

analysis including calculation of OR and respective 95% CIs.

The present study was approved by the Research Ethics Committees of the Federal University of São Paulo and the São Paulo Municipal Department of Health.

Results

In 2007, a total of 474 TB patients were studied. Of those, 166 were inpatients and 308 were outpatients. The comparison of the socio-demographic data related to the patients treated in the two regions (at PHC clinics or at one of the two hospitals studied) revealed similarities between the inpatients and the outpatients.

The main reasons for hospitalization were elucidation of the diagnosis (in 48.19%), respiratory failure (in 11.45%), hemoptysis (in 10.24%), AIDS (in 4.82%), wasting (in 3.61%) and others (in 21.69%).

Of the patients hospitalized for TB ($n = 166$; mean age, 41.0 ± 13.0 years), 116 (70%) were male, 115 (69%) presented the pulmonary clinical form, 115 (69%) were new cases, 119 (72%) were diagnosed at hospitals or in emergency rooms and 46 (28%) were diagnosed in primary health care clinics. Prior to hospitalization, 93.4% of those patients had been submitted to chest X-ray and 57.9% had been submitted to sputum smear microscopy for AFB.

Of the patients under outpatient treatment only ($n = 308$; mean age, 39.1 ± 16.2 years), 204 (66%) were male, 229 (74%) presented the

pulmonary clinical form, 263 (85%) were new cases and 175 (57%) were diagnosed in primary health care clinics (Table 1).

The univariate analysis (Table 1) showed positive associations between hospitalization due to TB and the following variables: 30-39 year age bracket (OR = 2.17); 50-59 year age bracket (OR = 2.17); combination of pulmonary and extrapulmonary forms of TB (OR = 5.31); TB retreatment (OR = 2.66); seeking treatment at other health care facilities prior to the diagnosis of TB (OR = 2.05); symptom duration of more than 12 weeks (OR = 2.23); and TB diagnosed at hospitals or in emergency rooms (OR = 4.68).

Of the patients under outpatient treatment only in the PHC clinics located in the south-eastern and northern regional health districts, 28.7% and 11.3%, respectively, were found to reside in other districts/cities (Figure 1).

Of the patients hospitalized for TB at the Mandaqui Hospital Complex, 77.6% resided in the northern regional health district and 22.4% resided in other regions (eastern, 3.1%; south-eastern, 4.1%; central-western, 5.1%; southern, 2.0%; and other cities, 8.2%). In contrast, of the inpatients at the *Hospital São Paulo*, only 36.8% resided in the same regional health district as that in which this hospital was located and 63.2% resided in other regions (eastern, 5.9%; northern, 10.3%; central-western, 4.4%; southern, 30.9%; and other cities: 11.8%).

The analysis of the locale of treatment of the discharged TB patients revealed that 39.7% of

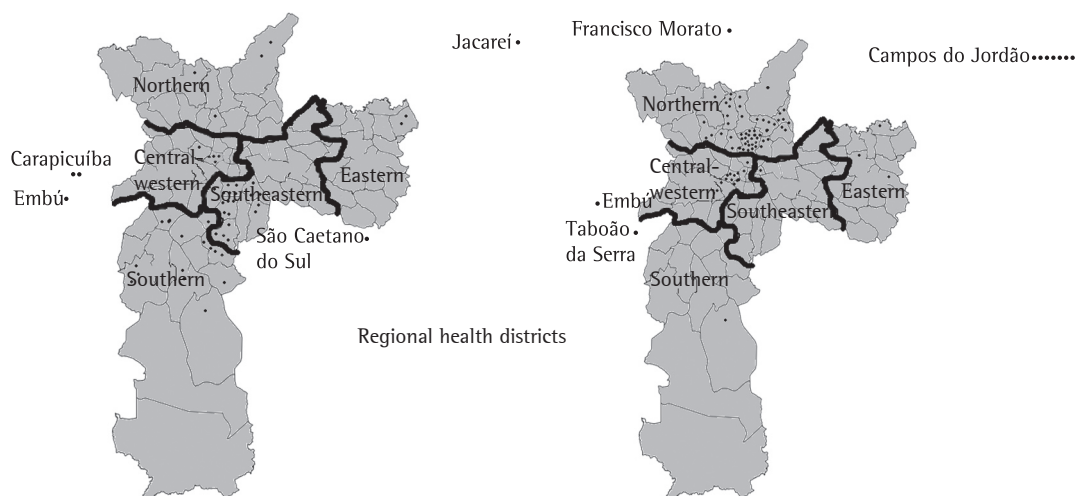


Figure 2 – District in which the primary health care clinics treating the tuberculosis patients discharged from the *Hospital São Paulo* and the *Hospital do Mandaqui* are located, São Paulo, Brazil, 2007.

the patients discharged from the *Hospital São Paulo* remained under treatment in the south-eastern regional health district, whereas 67.1% of the patients discharged from the Mandaqui Hospital Complex remained under treatment in the northern regional health district (Figure 2).

Discussion

Access is defined as the distance between the health care clinic and the place of residence of the individual, considering the time spent on transportation and the means of transportation used, as well as the difficulty in obtaining care and the treatment received.⁽¹³⁾ It is recommended that TB patients be treated as close as possible to their place of residence, and under supervision whenever possible, in order to promote higher adherence to treatment.⁽¹⁴⁾

Due to the regionalization of primary health care clinics, a large number of TB patients remain under treatment in the same regional health district as that in which they reside. In the present study, among the TB patients under outpatient treatment, 88.7% resided and were under treatment in the northern regional health district and 11.3% resided and were under treatment in the southeastern regional health district.

When patients need hospital care, the situation is even more complex in the city of São Paulo.

Inpatients are older, have more comorbidities and longer symptom duration, have previously sought other health care facilities for the same reason, have a history of TB treatment and present with more advanced disease. In addition, such patients are usually hospitalized due to diagnostic suspicion arising in a hospital or emergency room setting.⁽¹⁵⁾

Many (41%) reported having sought treatment in outpatient clinics previously, and, in the present study, 48% were hospitalized for elucidation of the diagnosis. Since most of these patients have pulmonary involvement, it seems that the outpatient treatment network is faulty, even in terms of requesting simple tests, such as chest X-ray and sputum smear microscopy for AFB. Prior to hospitalization, only 57.9% of the patients reported having been submitted to sputum examination.

Regarding access, the characteristics inherent to each hospital should be considered.

The Mandaqui Hospital Complex is a referral hospital that shows some characteristics of regionalization and serves patients who reside in the northern regional health district (77.6% resided in this regional health district). The *São Paulo Hospital* has characteristics of a university hospital and shows a low percentage of regionalization, with up to 63.2% of the patients hospitalized for TB coming from other regional health districts and cities. In addition, the southeastern regional health district, where the *Hospital São Paulo* is located, is geographically contiguous with the remaining regional health districts and has a greater quantity of equipment capable of meeting the highly complex demand and even absorbing the hospital demand from other regional health districts (especially that from the southern regional health district) and other localities.

Therefore, it is possible that patients spontaneously seek medical attention in areas recognized for their high quality of services or that patients can easily get to such areas using public transportation, or that such areas are close to their workplace and have a higher concentration of health care clinics, even if they are located in different regional health districts from that in which their place of residence is located.

This suggests that, in some regions in the city of São Paulo and in neighboring cities, the network of health care services (hospitals and outpatient clinics) is partially activated, with limited access and limited effectiveness in diagnosing and treating TB. Data in the literature show some reasons for patients receiving medical treatment far from their place of residence, such as the result of previous positive experiences and their satisfaction regarding the health care clinic, leading to the continuity of the treatment and the interference with its efficacy.⁽¹⁶⁾ The welcoming of patients to a given health care clinic when they need medical attention makes them faithful to that clinic, no matter how far it is, and the rate at which patients seek hospitals is explained by their expectation that their problems will be solved rapidly.⁽¹⁷⁾

It is likely that most patients in our sample, after having been hospitalized for TB, continued the treatment at a facility close to their place of residence, since we observed that only 39.7% of the inpatients at the *Hospital São*

Paulo continued the treatment in the south-eastern regional health district and that 67.1% of the inpatients at the *Hospital do Mandaqui* continued the treatment in the northern regional health district.

The outcomes of the treatment of the patients hospitalized for TB were worse than were those of the patients under outpatient treatment, and this is a source of concern to the PNCT.⁽¹⁰⁾

To date, there seems not to be a perfect integration between the hospitals and the PHC clinics that treat TB. Public policies for TB treatment, which are focused on primary health care services, neglect the great number of patients hospitalized for TB and fail to monitor the arrival of such patients at the PHC clinic after discharge. It is likely that some of these patients consider themselves cured at discharge and do not continue the treatment or that they do not receive full treatment in the PHC clinic to which they were referred. In addition, it is likely that their contacts are not investigated.

Based on these facts, it is necessary that hospital surveillance systems and health care workers be alerted to the importance of the correct referral of previously hospitalized patients to a PHC clinic. If possible, the PHC clinic should be close to the place of residence of the patients. In addition, patients should be monitored from the moment they arrive at the PHC clinic, with the initiation of supervised treatment and monitoring for adverse effects, as well as with the treatment and control of comorbidities.

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About the authors

Mirtes Cristina Telles Perrechi

Masters Student in the Postgraduate Program in Collective Health, Department of Preventive Medicine, *Universidade Federal de São Paulo* – UNIFESP, Federal University of São Paulo – São Paulo, Brazil.

Sandra Aparecida Ribeiro

Associate Professor. Department of Preventive Medicine, *Universidade Federal de São Paulo* – UNIFESP, Federal University of São Paulo – São Paulo, Brazil.